

# PATENT ABSTRACTS OF JAPAN

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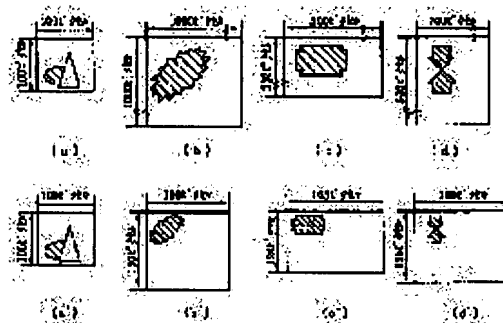
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## (54) THUMBNAIL DISPLAY DEVICE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To instantly obtain both information of picture and relative size on pictures having various sizes by determining a reduction factor with respect to original picture data having different sizes based on a difference between the maximum size and the minimum size and relatively grasping the picture size of a reduced image in addition to its pattern.

**SOLUTION:** First, the original picture data is retrieved, and a figure (a) being the minimum original data and a figure (b) being the maximum original data are extracted therefrom. These extracted minimum original picture data figure (a) and maximum original picture data figure (b) are compared, and its size differs in twice or more than twice, it is decided that the original picture data are compressed by a prescribed logarithm factor. Then, all the original picture data retrieved at first is reductively displayed in accordance with the logarithm factor or a compression factor determined by a one-dimensional factor, and as a result, figures a' to d' are obtained. Then, in the case where the difference of the size between the maximum picture data and the minimum picture data is equal to below twice, its magnification can be set unlimitedly.



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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to thumbnail \*\*\*\*\* which made it possible to be easy to grasp a pattern and size and to display the image of various sizes especially about an image display device.

[0002]

[Description of the Prior Art] In the conventional thumbnail display, each image is reduced to a fixed scale factor or a fixed size. In addition, the picture reproducer equipped with the thumbnail function in order to search the image memorized to the storage records each Hara (dimension) image data or its compressed data on the store, a thumbnail regenerative function is realized using the compressed data concerned or the predetermined thumbnail data created beforehand, and a thumbnail regenerative function is for referring to the content of the subject-copy image data memorized to the storage. About the conventional picture reproducer which has this thumbnail function, the publication of JP,8-195927,A, JP,7-200635,A, etc. is referred to, for example.

[0003]

[Problem(s) to be Solved by the Invention] However, in the conventional method mentioned above, by the fixed scale-factor reduced display, the differences of the image of the minimum size and the image of the maximum size differ extremely, and it has the trouble of it becoming impossible to distinguish the pattern of a small image.

[0004] Moreover, in the conventional method, by fixed size cutback, since the size of a former image is not known, there is a trouble that all the image data from which size differs in the same pattern is displayed identically, and cannot grasp the target image data.

[0005] Therefore, this invention is made in view of the above-mentioned trouble, and is for the object to offer the display which made it possible to display the image of various sizes that both the information on a pattern and relative image size is acquirable in an instant.

[0006]

[Means for Solving the Problem] In order to attain said object, the thumbnail indicating equipment of this invention determines a cutback multiplier based on the difference of the maximum size and the minimum size about the former image data of the size from which plurality differs, and is characterized by what was done for the image cutback image as [ grasp / relatively / only in addition to a pattern / image size ].

[0007] Moreover, this invention extracts the former image data of the maximum size, and the former image data of the minimum size about the former image data of the size from which plurality differs, and when it is beyond the predetermined value that the difference of said maximum size and minimum size defined beforehand, it is characterized by what a compression coefficient is defined in the logarithm of said size, and the former image data of the size from which said plurality differs is reduced and displayed for based on said compression coefficient.

[0008] This invention which it comes to constitute as mentioned above enables it to grasp not only a

pattern but a difference of size easily by having used the logarithm for the compressibility at the time of carrying out picture compression according to the difference of max/minimum size.

[0009]

[Embodiment of the Invention] The gestalt of operation of this invention is explained below with reference to a drawing. Drawing 1 is a flow chart for explaining the processing flow of the gestalt of operation of this invention.

[0010] If drawing 1 is referred to, the subject-copy image which indicates by the thumbnail will be searched (step 101), and the greatest image data and the minimum image data will be extracted among the searched image data (step 102).

[0011] Next, the comparison test of the difference of the maximum size extracted at the above-mentioned step 102 and the minimum size is carried out (step 103), and in being beyond the predetermined value that the difference defined beforehand, a logarithm is used for a multiplier and it reduces to it (step 104).

[0012] On the other hand, in the judgment of step 103, when the difference of the maximum size and the minimum size is smaller than the predetermined value defined beforehand, it reduces using a single dimension multiplier (step 105).

[0013] With the multiplier obtained at step 104 or step 105, all the target images are reduced with the same compression coefficient, and a thumbnail image is created and displayed (step 106).

[0014]

[Example] The example of this invention is explained below with reference to drawing 1 and drawing 2 about the gestalt of operation of above-mentioned this invention that it should explain to a detail further.

[0015] Drawing 2 (a) - drawing 2 (d) show the former image data which will indicate by the thumbnail from now on, and sizes are 100 pixel x100 pixel, 1000 pixel x1000 pixel, 300 pixel x200 pixel, and 500 pixel x700 pixel, respectively.

[0016] The former image data shown in drawing 2 (a), drawing 2 (b), drawing 2 (c), and drawing 2 (d) is first searched with step 101 of drawing 1, and drawing 2 (b) which is the greatest former data, and (1000 pixel x1000 pixel) are extracted in step 102. [ drawing 2 (a) which is the minimum former data out of this, (100 pixel x100 pixel) and ]

[0017] Next, drawing 2 (a) which is the former image data of the min extracted at step 103 is compared with drawing 2 (b) which is the greatest former image data, when the size is different more than twice, it progresses to step 104, when that is not right, it progresses to step 105, and a thumbnail is displayed in the magnitude proportional to the magnitude of former image data (steps 104-106).

[0018] In the example of this invention, since drawing 2 (a) and drawing 2 (b) have a twice [ more than ] as many difference as this, it progresses to step 105 and determines to compress former image data with the multiplier defined beforehand (logarithm multiplier), for example, a degree type, (1).

[0019]

Magnitude =  $\log_{10}$  (magnitude of dimension image data) of a cutback image -- (1) [0020] Next, at step 106, according to the compression coefficient already determined at step 104 (logarithm multiplier) or step 105 (single dimension multiplier), the reduced display of the former image data of all that were searched with step 101 is carried out, consequently drawing 2 (a'), drawing 2 (b'), drawing 2 (c'), and drawing 2 (d') are obtained, respectively.

[0021] Here, when the difference of the size of the maximum image data and the minimum image data is 2 double less or equal, like the conventional method although it indicates by compression, it is also possible to change this with 1.5 times, 3 times, etc. depending on a demand of the resolution of a display, magnitude, and a user, and this scale factor can be set up without a limit.

[0022] Moreover, it is possible to consider as the multiplier of arbitration, such as not only  $\log_{10}()$  but  $\log_{20}()$ ,  $\log_5()$ , etc., also about the multiplier which carries out logarithmic compression.

[0023]

[Effect of the Invention] As explained above, it not only uses a fixed value for reduction percentage, but according to this invention, it does so the effectiveness that not only a pattern but a difference of size can

be grasped easily, by having used the logarithm.

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[Translation done.]